

WHAT IS CLAIMED IS:

- 1 1. A shift pressure control apparatus for controlling a
2 shift pressure to perform a shift in an automatic
3 transmission, the shift pressure control apparatus
4 comprising:
5 a controller
6 to determine a starting input-torque-dependent
7 pressure from a transmission input torque at a start of a
8 shift;
9 to hold the shift pressure at the starting input-torque-
10 dependent pressure during the shift;
11 to monitor an operating parameter representing an
12 engine load of an engine connected with the automatic
13 transmission, to detect an engine load change; and
14 to modify the shift pressure to a modified pressure
15 determined by modifying the starting input-torque-
16 dependent pressure with a difference between a second
17 engine-load-dependent pressure determined from the
18 engine load after the engine load change and a first
19 engine-load-dependent pressure determined from the
20 engine load at the start of the shift when the engine load
21 change is detected.
- 1 2. The shift pressure control apparatus as claimed in
2 Claim 1, wherein the controller is configured to detect the
3 engine load change when a change in the operating
4 parameter representing the engine load is greater than or
5 equal to a predetermined value.

1 3. The shift pressure control apparatus as claimed in
2 Claim 1, wherein the controller is configured to modify the
3 shift pressure to the modified pressure determined by
4 adding the difference between the second engine-load-
5 dependent pressure and the first engine-load-dependent
6 pressure, to the starting input-torque-dependent pressure.

1 4. The shift pressure control apparatus as claimed in
2 Claim 1, wherein the controller is configured to detect the
3 start of the shift; to store a value of the operating
4 parameter and a value of the engine input torque at the
5 time of detection of the start of the shift; to determine the
6 starting input-torque-dependent pressure from the value of
7 the engine input torque stored upon detection of the start
8 of the shift, to hold the shift pressure equal to the starting
9 input-torque-dependent pressure; to detect the engine load
10 change during the shift; to store a value of the operating
11 parameter at the time of detection of the engine load
12 change; and to vary the shift pressure from the starting
13 input-torque-dependent pressure to the modified pressure
14 which is set equal to a sum of the starting input-torque-
15 dependent pressure and the difference between the second
16 engine-load-dependent pressure and the first engine-load-
17 dependent pressure.

1 5. The shift pressure control apparatus as claimed in
2 Claim 1, wherein the shift pressure control apparatus
3 further comprises a throttle sensor to sense a throttle
4 opening of a throttle valve for the engine, and the

5 operating parameter is the throttle opening sensed by the
6 throttle sensor.

1 6. The shift pressure control apparatus as claimed in
2 Claim 1, wherein the controller is configured to determine
3 the starting input-torque-dependent pressure from the
4 transmission input torque at the start of the shift,
5 according to a pressure-torque characteristic of a desired
6 input-torque-dependent fluid pressure with respect to the
7 transmission input torque; and wherein the desired input-
8 torque-dependent fluid pressure of the pressure-torque
9 characteristic increases as the transmission input torque
10 increases.

1 7. The shift pressure control apparatus as claimed in
2 Claim 1, wherein the controller is configured to determine
3 the first engine-load-dependent pressure from the
4 operating parameter representing the engine load at the
5 start of the shift, and the second engine-load-dependent
6 pressure from the operating parameter representing the
7 engine load after the engine load change, by using a
8 pressure-load characteristic of a desired engine-load-
9 dependent fluid pressure with respect to the operating
10 parameter.

1 8. The shift pressure control apparatus as claimed in
2 Claim 7, wherein the desired engine-load-dependent fluid
3 pressure of the pressure-load characteristic increases as
4 the engine load increases.

1 9. The shift pressure control apparatus as claimed in
2 Claim 1, wherein the controller is configured to determine
3 the first engine-load-dependent pressure from the
4 operating parameter representing the engine load at the
5 start of the shift, and the second engine-load-dependent
6 pressure from the operating parameter representing the
7 engine load after the engine load change, by using a
8 pressure-load characteristic of a desired engine-load-
9 dependent fluid pressure with respect to the operating
10 parameter, set to restrain a shift shock in the transmission.

1 10. A shift pressure control process for controlling a shift
2 pressure to perform a shift in an automatic transmission,
3 the shift pressure control process comprising:
4 determining a starting input-torque-dependent
5 pressure from a transmission input torque at a start of a
6 shift;
7 holding the shift pressure at the starting input-torque-
8 dependent pressure during the shift;
9 monitoring an operating parameter representing an
10 engine load of an engine connected with the automatic
11 transmission, to detect an engine load change; and
12 modifying the shift pressure to a modified pressure
13 determined by modifying the starting input-torque-
14 dependent pressure with a difference between a second
15 engine-load-dependent pressure determined from the
16 engine load after the engine load change and a first
17 engine-load-dependent pressure determined from the
18 engine load at the start of the shift when the engine load
19 change is detected.

1 11. The shift pressure control process as claimed in Claim
2 10, wherein the shift pressure control process further
3 comprises
4 detecting the start of the shift;
5 storing a value of the operating parameter, as the
6 engine load at the start of the shift and a value of the
7 engine input torque, as the transmission input torque at
8 the start of the shift, upon detection of the start of the
9 shift;
10 detecting the engine load change during the shift;
11 storing a value of the operating parameter, as the
12 engine load after the engine load change, upon detection of
13 the engine load change; and
14 adding the difference between the second engine-load-
15 dependent pressure and the first engine-load-dependent
16 pressure, to the starting input-torque-dependent pressure.